

## CLAIMS:

1. An X-ray examination apparatus which includes

- an X-ray source (1) for emitting an X-ray beam (8) having a central X-ray extending along a central beam line (4), and
- an X-ray detector (2) for picking up X-ray images, where
- 5     - the X-ray detector (2) and the X-ray source (1) are rotatable together about an axis of rotation (3), and
- a calibration system (6, 7) which is provided with
  - a calibration phantom (6) and
  - a calibration control unit (7) which is arranged
  - 10     - to form separate calibration images for different, notably essentially opposed directions of the X-ray beam, and
  - to determine the zero orientation of the X-ray source with the X-ray detector from differences between the positions in the individual calibration images of the same aspect of the imaged calibration phantom, where
  - 15     - the central beam line (4) extends perpendicularly to the axis of rotation (3) in the zero orientation.

2. An X-ray examination apparatus as claimed in claim 1, wherein the axis of rotation and the central beam line intersect in an isocenter (9), and

- 20     - wherein the calibration phantom is positioned outside the isocenter so as to form the calibration X-ray images.

3. An X-ray examination apparatus as claimed in claim 2, wherein the distance between the isocenter and the calibration phantom during the formation of at least one of the

25     calibration X-ray images is larger than the distance between the X-ray detector and the calibration phantom.

4. An X-ray examination apparatus as claimed in claim 1, wherein

